

## ***Cactoblastis cactorum* Activities Report for MAY 2006**

**Joel Floyd, USDA-APHIS-PPQ-EDP, Riverdale, MD**

**MEETINGS SCHEDULED.** A meeting will be held in Pensacola, FL on June 22<sup>nd</sup> with ARS and APHIS to discuss short and long range operational plans, roles and responsibilities, and other issues related to the survey and control program in Alabama and the Florida Panhandle. A meeting of rearing experts is scheduled for July 18-19 in Tifton, GA to gather expertise around cactus moth rearing challenges.

**IDENTIFICATION/SURVEY.** The Mississippi State University GeoResources Institute's Cactus moth detection activities continue with logging of new host sites and new sentinel sites in Louisiana and Texas on Forest Service lands and at the US Marine Corp Camp Lejeune, NC. There have been no detections in Mississippi or on Gulf Islands National Seashore ahead of the known leading edge infestation along the Gulf Coast.

**BUDGET.** A request for permanent funding for *Cactoblastis* research and program activity in the fiscal year 2008 budget was not accepted at the APHIS level during discussions on what programs required increases. In this fiscal year, APHIS is funding \$ 500,000 and the funds from SAGARPA (Mexico) amount to \$ 463,000. These levels are expected to continue from both sources in 2007. For the last three years, a budget request for a permanent line item of \$1.5 million has been submitted but not accepted. Last year the request was supported by APHIS, but the Department did not accept it. Competing APHIS priorities in lean budget years include preparedness for serious animal disease issues like BSE and avian influenza, plus funding for PPQ's invasive forest pest issues such as the Asian longhorned beetle, emerald ash borer, sudden oak death, and various more traditional agricultural pests.

**REGULATION.** Two work-plans are now in the APHIS Regulatory Analysis and Development; staff have completed economic analysis and are nearly ready for OGC review. One is the continental domestic regulation on *Opuntia*, *Consolea*, *Cylindropuntia*, *Nopalea*, prohibiting movement of live plant material from Alabama, Florida, Georgia, and South Carolina. The other tightens up existing territorial and Hawaiian restrictions and adds a prohibition of fresh plant material from foreign countries that have *Cactoblastis cactorum*.

**OUTREACH.** A presentation on cactus moth was given to the Native American Fish & Wildlife Society meeting in Bar Harbor, ME. New Mexico PPQ distributed Cactus moth ID cards to the Zia and Jemez Pueblos, and to several NM Cooperative Extension agents. Approximately 150 IAEA video.DVD's on the cactus moth were sent to Texas A&M's rangeland cooperative extension specialist, Baron Rector for outreach to county extension agents. The American Horticulture Society's magazine known as American Gardener plans to do a story on the cactus moth for their July/August issue.

**PPQ FIELD ACTIVITY.** TDY personnel Steve Bobstedt and Darrell DeMont led by Maurice Duffel continued to perform clean-up work and release sterile insects in cooperation with ARS at Ft. Morgan. Additional infested pads were removed at Bon Secour National Wildlife Refuge but we are still waiting on permit approval from the US Fish and Wildlife Service for removal from

of the *Smilax* sp. vine that obscures effective visual inspection of prickly pear and sterile release on the refuge. Interns from the refuge helped APHIS-PPQ employees with infested pad removal. Two tons of plans were removed from Ft. Morgan and Bon Secour during May. Traps were also checked.

The Pensacola office lease has been signed and should be ready for occupancy when a few more items are taken care of. Maurice is securing furniture from the Eglin Airforce Base furniture surplus warehouse and two pickup trucks are being transferred from Mobile, AL office thanks to SPHD Bill Moore. A trailer is being purchased to haul infested cacti to the landfill.

A cooperative agreement for rearing startup/experimentation by Florida DPI was sent from the PPQ Eastern Region for approval.

**TECHNICAL LIAISON.** Stephanie Bloem collected and compiled all reports for May program activities. Report was translated to Spanish for distribution to collaborators at SAGARPA/SENASICA.

**Stephen Hight, USDA-ARS-CMAVE Laboratory, Tallahassee, Florida**  
**Jim Carpenter, USDA-ARS-CPMRU Laboratory, Tifton, Georgia**

**SIT VALIDATION.** Traps were serviced at least once per week at the SIT validation sites during the month of May. Total and average monthly trap captures of wild *C. cactorum* for all sites is presented in Table 1. The average number of moths per trap is based on weekly averages for each month. Data for April has been corrected in Table 1 for this report. Comparisons between sites need to be made with caution since traps at Little Dauphin Island and Ft. Morgan were not established in a grid as were traps at other sites. Releases of sterile *C. cactorum* were made in Alabama at Dauphin Island, Little Dauphin Island, and Ft. Morgan (Table 2). Release and recapture information at Ft. Morgan is presented in Table 3 and Figs. 1 and 2.

Table 1. Wild *C. cactorum* (Cc) captured in traps during April and May 2006.

Location	Dauphin Is., AL	Little Dauphin Is., AL	Ft. Morgan, AL	Pensacola Beach, FL	Okaloosa Is., FL	St. George Is., FL
# Traps	53	5	16	70	33*	53
# Cc -April	2	15	182	1824	236	394
# Cc - May	1	2	21	90	29	80
Avg. # Cc/Trap - April	0.009	0.8	2.8	6.5	1.8	1.8
Avg. # Cc/Trap - May	0.005	0.2	0.3	0.3	0.2	0.4

\* A trap was added to Okaloosa Island in May to bring the total # traps to 34.

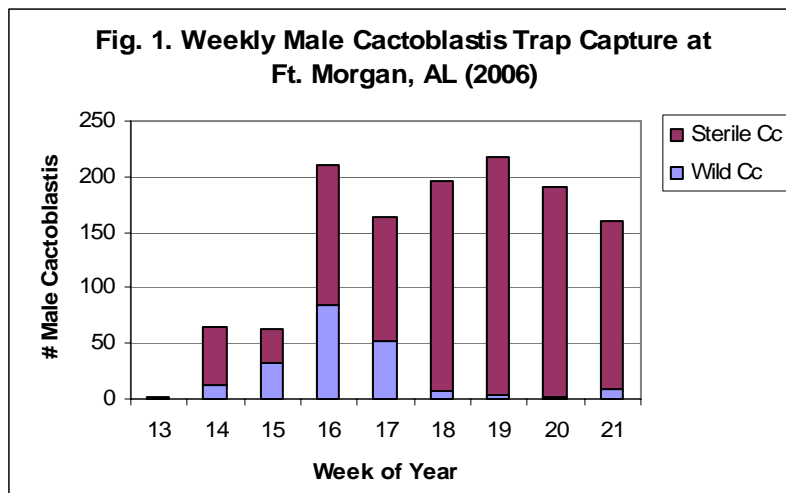
Table 2. May release totals of irradiated *C. cactorum* made at three Alabama sites.

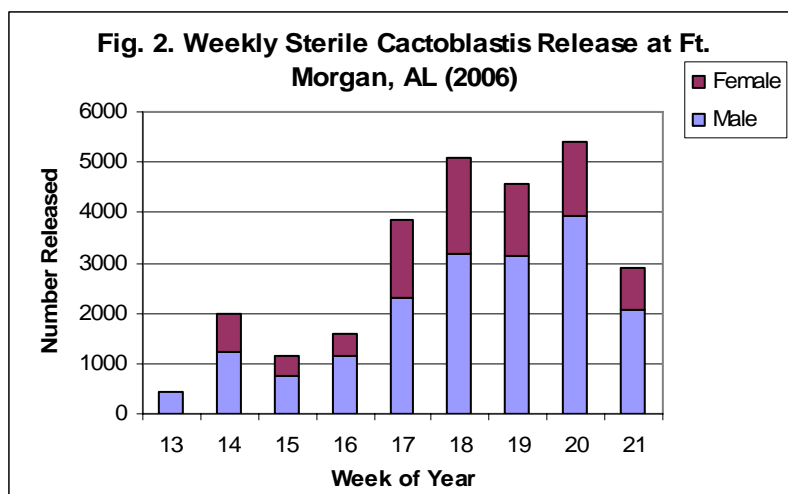
LOCATION	NUMBER OF STERILE Cc RELEASED		
	♂	♀	TOTAL
Ft. Morgan, AL	12,300	5,686	17,986

Little Dauphin Island, AL	2,842	1,920	4,762
Dauphin Island, AL	362	196	558

Table 3. Weekly trap captures for male *C. cactorum* (Cc), number of male and female sterile moths released, and percent sterile males released that were recaptured at Ft. Morgan, AL, February-May 2006.

MONTH	WEEK OF YEAR	Cc CAPTURED		STERILE Cc RELEASED		% STERILE ♂ Cc RECAPTURED
		WILD ♂ Cc	STERILE ♂ Cc	♂	♀	
February	8	0	--	--	--	--
March	12	0	--	--	--	--
March	13	1	0	443	0	--
April	14	13	52	1236	758	4.2
April	15	32	31	747	422	4.2
April	16	84	127	1144	456	11.1
April	17	52	110	2312	1547	1.5
May	18	7	189	3163	1942	6.0
May	19	3	214	3139	1433	6.8
May	20	2	189	3925	1475	4.8
May	21	9	151	2073	836	7.3





**ECOLOGICAL AND QUALITY CONTROL FIELD STUDIES.** Flight Periods and Degree-Day Model. Weekly-collected trap bottoms sent by collaborators from the 5 sites were scored, analysis updated, and outcomes forwarded back to collaborators.

Mating Status of Trapped *C. cactorum*. We determined the mating status of males captured in traps located at release sites. This data provides information about the age of the wild males being captured and the competitiveness of released males.

Technology Development for Assessing Program Efficacy. The technique was “tested” by participants of an IAEA sponsored training course held at the Entomology and Nematology Department, University of Florida. Results from this testing indicated that this technique will allow us to improve the accuracy of estimating overflooding ratio (irradiated/sterile : wild) and estimating the competitiveness of released/irradiated males.

**TECHNOLOGY TRANSFER TO APHIS.** A trailer was delivered to Ft. Morgan for APHIS clean-up activities. Trapping supplies were dropped off at Ft. Morgan for APHIS trapping activities. Correspondence with APHIS occurred on an ongoing basis with respect to planning and progress.

**TECHNOLOGY TRANSFER TO DPI.** In collaboration with Ken Bloem (APHIS), continued to correspond with DPI to assist in developing their future activities in mass rearing *C. cactorum*.

**COLONY MAINTENANCE AND MASS-REARING.** Cladode Rearing: 110,000 larvae were set up during May. Approximately 13,000 pupae and 8,000 adults were collected. We shipped 400 pupae to the ARS in Miami for pheromone identification bioassays. Approximately 7,500 moths were irradiated and released.

Artificial Diet Rearing. Because of continued problems with disease in the larvae reared on artificial diet, most of the adults emerging from these colonies were used for release and not for egg production. Approximately 16,000 moths were irradiated and released.

Larval mortality during May was approx. 54,000.

Egg collection for May was approx. 145,000.

Pupae collected for the month of May – U.S. 4,000, S.A. 30,100.

Both colonies required approx. 100 liters of diet.

At the end of May there were approx. 142,000 larvae in various stages of production.

REARING STUDIES. Diet trials for *C. cactorum* described in the March Progress Report are still on-going.

ADDITIONAL ACTIVITIES. Trapping Beyond Leading Edge. Trapping supplies were sent to Mike Wallace (AZ Department of Agriculture), Bill Spitzer (APHIS-PPQ, LA), and Gary Hopkins (National Park Service, MS).

**R. Heath, N. Epsky, USDA-ARS-SHRS Laboratory, Miami, Florida**

**ACTIVITIES AND ACCOMPLISHMENTS.** Three shipments of pupae were received from ARS Tifton. Males from these shipments were used to complete the third replicate of flight tunnel bioassays to test response to the 3, 4, 5 and 6 component lure formulations versus response to live virgin females. Females were used to obtain additional gland extracts for chemical analysis. Research on improved analytical chemistry techniques has continued. In the study of insect pheromones and attractants, many times there is a need to analyze samples in very low, even trace amounts. This calls for a system in which large volumes of very dilute samples can be injected and analyzed. In the case of putative cactus moth pheromones, there is also a need for a column with a high polarity stationary phase in order to properly separate and identify the compounds of interest. High polarity columns normally have a low injection capacity, therefore not allowing such large volumes as required for trace analysis. To this day, there is no known system or method capable of fully satisfying these needs. The objective of this study is to develop and optimize such method with the use of several types of desolvation columns as retention gap to allow larger injection volumes while minimizing the solvent effect. For this purpose a series of experiments were carried out using a gas chromatograph, with a large volume on column injector, a solvent venting valve, and a very polar column connected to a flame ionization detector. Three different types of desolvation columns were tested in order to improve the separation and peak shape of putative cactus moth pheromones. This technique will be used to analyze large volumes of very dilute samples obtained from volatile collections of calling female moths.